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GEOMETRY.

290. Proposed by **DR. L. E. DICKSON**, The University of Chicago, Chicago, Ill.

Given nine points lying by threes in three columns and in three rows, draw through them, by continuous motion, a broken line composed of only four straight segments, and passing but once through each of the nine points. [A current puzzle.]

291. Proposed by **FRANCIS RUST**, C. E., Allegheny, Pa.

The pedal line of any point on a triangle's circum-circle bisects the distance between this point and the ortho-center of the triangle.

292. Proposed by **REV. R. D. CARMICHAEL**, Hartselle, Ala.

Apply the locus of $(x^2+y^2)^3=mx^3$ to the problem of finding a cube m times a given cube.

293. Proposed by **W. J. GREENSTREET**, M. A., Editor Mathematical Gazette, Stroud, England.

A variable circle touches an ellipse, and the chord of contact through the other two points of intersection touches a similar coaxial ellipse. Find the locus of the center of the variable circle.

294. Proposed by **JOHN JAMES QUINN**, Ph. D., Warren, Pa.

a) Suppose an indefinite line be pivoted at the end of a revolving radius whose center is the origin; and the initial position of the radius is coincident with the X-axis and the pivoted line perpendicular to it. As the radius revolves through equal amounts of arc the line moves to the right over corresponding equal intercepts on the X-axis. What is the equation of the locus of a point on the line whose distance from the end of the radius is equal to a diameter?

b) Show how the locus can be applied to the multisection of an angle.

c) Suppose the diameter be laid off in both directions.

MECHANICS.

190. Proposed by **DR. L. E. DICKSON**, The University of Chicago. Chicago, Ill.

Given the axiomatic principle of Physics which is equivalent to the theorem on the compound of two circles ("Graphical Methods in Trigonometry," MONTHLY, June-July, 1905).

191. Proposed by **J. EDWARD SANDERS**, Reinersville, Ohio.

A pole hinged at the bottom leans against the mid-point of a smooth rope suspended from two supports of equal height. Determine the position of equilibrium.

192. Proposed by **REV. J. H. MEYER**, S. J., College of the Sacred Heart. Augusta, Ga.

Find the velocity of a planet at a given point in its orbit.